ORIGINAL

LAWLER, METZGER & MILKMAN, LLC

1909 K STREET, NW
SUITE 820
WASHINGTON, D.C. 20006
PHONE (202) 777-7700
FACSIMILE (202) 777-7763

EX PARTE OR LATE FILED

October 13, 1999

By Hand

Magalie Roman Salas
Secretary
Federal Communications Commission
Room CY-A257
445 Twelfth Street, SW
Washington, D.C. 20554

Re: Written *Ex Parte* Presentation
Service Rules for the 746-764 and 776-794 MHz Bands,
And Revisions to Part 27 of the Commission's Rules
WT Docket No. 99-168

Dear Ms. Salas:

Transmitted herewith for inclusion in the public record of the above-referenced "permit but disclose" proceeding are two copies of a written *ex parte* presentation that was delivered this day to Thomas J. Sugrue, Chief of the Wireless Telecommunications Bureau, as well as the FCC officials listed below as receiving copies of this letter.

Please direct any questions concerning this filing to the undersigned.

Sincerely,

Charles W. Logan

cc:
James D. Schlichting
Kris Monteith
Tom Stanley
Ronald Netro
Jane Phillips
Gregory Vadas
Herb Zeiler
Robert Pepper
Evan Kwerel
Bruce Franca
Sean White
Kathleen Ham
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Enclosure

LAWLER, METZGER & MILKMAN, LLC

1909 K STREET, NW
SUITE 820
WASHINGTON, D.C. 20006
PHONE (202) 777-7700
FACSIMILE (202) 777-7763

October 13, 1999

By Hand

Thomas J. Sugrue, Chief
Wireless Telecommunications Bureau
Federal Communications Commission
445 Twelfth Street, S.W. – Third Floor
Washington, D.C. 20554

Re: Written *Ex Parte* Communication
Service Rules for the 746-764 and 776-794 MHz Bands,
And Revisions to Part 27 of the Commission's Rules
WT Docket No. 99-168

Dear Mr. Sugrue:

This written *ex parte* communication is submitted on behalf of FreeSpace Communications (FreeSpace) for consideration in connection with the above-referenced rulemaking proceeding. The *Notice of Proposed Rulemaking* (*Notice*) in this proceeding proposes service rules for commercial licensing in the 746-764 MHz and 776-794 MHz bands.[1]

FreeSpace recommends that the Commission license eight 1 MHz channels in the 746-748 MHz, 762-764 MHz, 776-778, and 792-794 MHz bands on a nationwide basis for low power services and without limitation as to the particular type of service provided on these channels. This will ensure that public safety facilities operating in adjacent bands receive maximum protection from interference. It will also promote innovative and efficient uses of the spectrum that can greatly benefit consumers, including those that live in presently underserved areas.

A. The FreeSpace System

FreeSpace is a start-up company founded by one of Silicon Valley's preeminent computer scientists and three leading radio communications experts. (Attachment A provides a biography of the firm.) FreeSpace's founders have developed a new, innovative wireless communications technology that will provide consumers inexpensive broadband voice and data services, including internet connections. The FreeSpace network is comprised of handsets and modems that transmit data and voice via a wireless link to small antennas that are mounted on either existing transmission towers or small

[1] *Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, Notice of Proposed Rulemaking*, WT Docket No. 99-168, FCC 99-97 (released June 3, 1999).

base stations located throughout a community. These base stations can be linked to the internet through either wireline digital subscriber lines or other high speed internet connections, thus leveraging the power of the internet.

This wireless communications network is extraordinarily flexible and dynamic. The FreeSpace system applies the design characteristics that have made the internet so successful -- the decentralized routing of packetized data -- to wireless communications. This innovative design permits the FreeSpace system to operate at very low power levels and to use a minimal amount of spectrum to create a nationwide wireless voice and data communications network. The FreeSpace system permits the establishment of such a network with as little as 4 MHz of spectrum, although access to 8 MHz would be optimal. The FreeSpace system is capable of working with this 8 MHz of spectrum divided into channels as small as 500 kHz in bandwidth distributed throughout a band.

B. FreeSpace's Spectrum Licensing Proposal

System designs such as the FreeSpace system offer the Commission an opportunity in this proceeding both to promote innovative wireless voice and data services for consumers *and* to protect adjacent-channel public safety operations from interference. In particular, as depicted in Attachment B, FreeSpace recommends that the FCC license eight 1 MHz, paired channels in the 746-748, 762-764, 776-778, 792-794 MHz bands (numbered channels 1-8 in the chart below).

UHF Channels:

60	61	62	63	64	65	66	67	68	69

Proposed Licensing Plan:

FreeSpace proposes that the Commission adopt the following channelization scheme and power spectral density limits in order to protect public safety operations:

- *Proposed Channels 4, 5, and 8*: Licensees operating on the channels immediately adjacent to the public safety band (*i.e.*, the channels operating at 763-764 MHz, 776-777 MHz, and 793-794 MHz) would be required to operate at a peak transmit power spectral density that does not exceed 4 mW/kHz. If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density would be required to be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.[2]

- *Proposed Channels 3, 6, and 7*: Licensees operating on a second-adjacent channel to the public safety band (*i.e.*, the channels operating at 762-763 MHz, 777-778 MHz, and 792-793 MHz) would be required to operate at a peak transmit

[2] *Cf.* 47 C.F.R. § 15.407(a)(3).

power spectral density that does not exceed 20 mW/kHz. If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density would be required to be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

• *Proposed Channels 1 and 2*: In addition to these six, low power 1 MHz channels, the Commission should also license two additional 1 MHz channels at 746-748 MHz. Because these channels are located well away from the public safety band, they could operate at higher transmit power levels without any risk of causing interference to public safety communications. With the addition of these two channels, licensees would be able to operate part of their networks at higher power levels, thereby creating larger cells that are particularly useful in serving more sparsely populated areas.

• *Remaining 28 MHz*: The remaining 28 MHz of spectrum in channels 60-62/65-67 (*i.e.*, 748-762 MHz and 778-792 MHz) would be made available for licensing for higher powered mobile and fixed wireless services.

FreeSpace strongly recommends that there be no limitation placed on the type of commercial services that can be offered on the eight 1 MHz channels. They should be licensed pursuant to an auction that is open to all interested bidders. This is consistent with section 337 of the Communications Act of 1934, as amended,[3] and the flexible licensing rules proposed by the Commission in the *Notice*.[4] It would also maximize the efficient use of the spectrum.

In addition, FreeSpace agrees with the many commenters that opposed the authorization of additional, high powered broadcast stations in the 700 MHz band. As those commenters pointed out, such broadcast facilities are incompatible with mobile wireless services and would result in unacceptable levels of interference.[5] FreeSpace, however, does not oppose the authorization of a "broadcast" service that must comply with power limits and other technical requirements that will make it compatible with other users of the 700 MHz band. The point is not to preclude or support a particular type of service; the competitive bidding process and the marketplace should determine which service is most valuable to the public. The objective should be to establish technical requirements that prevent interference and provide a stable operating environment that will facilitate investment in the technologies and services that will operate in this band.

Finally, FreeSpace supports the use of bidding credits and other incentives to promote participation by small businesses in the competitive bidding for licenses in the commercial 700 MHz band. Moreover, although it recognizes that the issue is still under

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[3] 47 U.S.C. § 337.

[4] *Notice* at ¶ 12.

[5] *See, e.g.*, Comments of APCO at 3; Comments of Motorola at 8-11; Comments of Airtouch at 12-13; Comments of US West at 6-9.

consideration in WT Docket No. 99-266, FreeSpace supports the use of bidding credits for bidders willing to commit to providing service to tribal lands or other underserved areas.[6] As described below, the FreeSpace system is well suited to provide service to such communities.

In the following sections, FreeSpace expands on several important aspects of its proposed spectrum plan and the issues raised in this proceeding.

1. *The Proposal Will Prevent Interference to Public Safety Operations*

In devising rules for the services that will operate in the 746-764 and 776-794 MHz bands, the Commission must ensure that public safety communications operating in adjacent bands are not subject to interference from broadcast operations or commercial wireless facilities. Section 337(d)(4) of the Act expressly requires the Commission to "establish rules insuring that public safety services licensees [in the 746-806 MHz band] shall not be subject to harmful interference from television broadcast licensees."[7] In addition, the legislative history of these provisions makes it clear that it was Congress's intent that "the Commission ensure that public safety service licensees continue to operate free of interference from any new commercial licensees."[8]

A number of parties have submitted comments in this proceeding emphasizing the vital need to carry out the statutory mandate to protect public safety communications from interference. The National Coordination Committee (NCC), established by the Commission to recommend rules relating to the 700 MHz public safety band, has expressed concern about the potential for interference to public safety communications from both new broadcast stations as well as commercial mobile radio operations that may be authorized in the 746-764 and 776-794 MHz bands. It has urged the Commission to address these concerns by "establish[ing] ... strong, well-defined interference guidelines" to protect "the adjacent public safety spectrum [that] will be heavily occupied with communications critical to the safety of life and property."[9]

The Association of Public-Safety Communications Officials-International, Inc. (APCO) has similarly urged the Commission to adopt rigorous precautions to protect both current *and* future public safety operations. It has opposed the authorization of new broadcast stations in the 746-764 and 776-794 MHz bands for this reason.[10] APCO has also stated that it "is ... deeply concerned with interference from adjacent-channel

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[6] *Extending Wireless Telecommunications Services to Tribal Lands, Notice of Proposed Rulemaking*, WT Docket No. 99-266, FCC 99-205, ¶¶ 50-53 (released Aug. 18, 1999).

[7] 47 U.S.C. § 337(d)(4).

[8] Balanced Budget Act of 1997, Conference Report to Accompany H.R. 2015, 105th Cong., 1st Sess., Report 105-217, at 580 (July 30, 1997).

[9] Letter from Kathleen M. H. Wallman, Chair, NCC, to Chairman Kennard, WT Docket No. 99-168 (Aug. 25, 1999).

[10] APCO Comments at 3.

commercial mobile radio services."[11] It consequently has asked the Commission to "limit the types and nature of non-broadcast commercial mobile radio operations on adjacent channels and/or provide a sufficient guard band within the commercial spectrum to prevent interference with public safety systems."[12]

FreeSpace's spectrum licensing proposal fills this need by providing a clear, effective way for the Commission to meet its statutory mandate of protecting public safety operations in the 700 MHz band. It takes a very straightforward approach: a guard band in which licensees must comply with low power spectral density limits. This approach would provide full interference protection to current and future public safety communications without the need for costly, and often ineffective, coordination procedures among users.

In-band emissions limits should be specified in terms of power spectral density instead of peak power because doing so will provide more effective protection to public safety operations in adjacent bands. A limit on power spectral density places a bound on the total amount of power that is permitted within the band, independent of channel bandwidth. In contrast, peak power limits allow for the concentration of power into narrow bandwidth channels so that the total power permitted across the band may increase without a well-defined upper bound. This may present an interference hazard to operations in adjacent bands. An additional advantage of specifying a limit on power spectral density rather than peak power is that such a limit allows the flexible specification of channel bandwidth while maintaining a constant signal-to-noise ratio. This permits broadband services to be offered over the same range as narrowband services and thus encourages the deployment of broadband services.

A number of private radio proponents have argued that the Commission should establish guard bands adjacent to the public safety bands and limit the use of these guard bands to private radio licensees to protect public safety communications from interference. According to these parties, "interference from private systems into public safety systems would be managed, as it is now, by the frequency coordination process."[13] But, as explained below, such an exclusive set aside for private radio is inconsistent with Section 337 of the Act and sound spectrum management policies. Aside from this fact, the FreeSpace proposal provides a far superior and straightforward means of protecting public safety operations. Rather than relying on cumbersome, inefficient, and at times ineffective frequency coordination methods, the FreeSpace system provides maximum

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[11] APCO Reply Comments at 1-2. APCO states that an "example of the type of problem that could occur at 700 MHz is the recent interference created by certain Nextel facilities in the 800 MHz band. In one well-documented instance in Washington County, Oregon, a Nextel digital transmitter site (using Motorola's iDEN system) created destructive interference to public safety radio facilities at a nearby fire station operating on adjacent frequencies. Significantly, the Nextel site was otherwise in compliance with the required emission mask." *Id.* at 2.

[12] APCO Comments at 3.

[13] *See* Letter of Leigh Chinitz and Steve Sharkey of Motorola, Inc. to Magalie Roman Salas, FCC Secretary, at 2 (filed Sept. 15, 1999).

interference protection for public safety by imposing power spectral density limits in the immediately adjacent spectrum bands. This obviates any need to "manage" or "coordinate" uses in adjacent bands by establishing a clear technical standard that eliminates the potential for any harmful interference. Moreover, it is unclear how a frequency coordination process would protect future public safety operations; indeed, a "first-in-time" private radio system facility could very well end up interfering with a subsequently installed public safety device operating on the adjacent channel. The FreeSpace proposal, in contrast, would protect future as well as current public safety operations.

2. *The FreeSpace Proposal Would Support Innovative Uses of the Spectrum and Promote Services to Underserved Audiences*

In addition to providing a guard band to protect public safety operations, the FreeSpace proposal would create an opportunity for small business entrepreneurs to offer new, innovative wireless services to consumers. A number of commenters have similarly urged the Commission to establish rules in this proceeding that will encourage innovative and efficient uses of the spectrum.[14]

FreeSpace's innovative system design would offer consumers a new broadband wireless service. It makes very efficient use of the spectrum by providing data services at rates of up to 2 Mbps, thereby giving consumers a wireless connection to the internet. The FreeSpace system also is capable of carrying voice communications. Moreover, these data and voice services can be provided to consumers at low cost. This is due to the fact that, as described above, the FreeSpace system employs a ground-breaking design that permits the construction of flexible, dynamic wireless networks at very low costs. In addition, handsets and other equipment are expected to be inexpensive.

These low infrastructure and equipment costs mean significantly lower service costs for consumers. This will benefit all Americans, especially those currently living in underserved areas. The principal obstacle to bringing telecommunications to these areas has been the high infrastructure costs of installing wireline and even wireless broadband connections in rural areas. These costs deter most telecommunications providers given the relatively low economic return they can typically expect from serving such sparsely populated areas. This cost barrier has denied millions of Americans access to telecommunications services and the information revolution.

This problem has been particularly acute for tribal lands. Compared to the national average of 94 percent, telephone subscribership rates on tribal lands are less than 50 percent in many instances.[15] The Commission has initiated a rulemaking proceeding

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[14] *See, e.g.*, Comments of ArrayComm; Reply Comments of DDI Pocket, Inc.; Reply Comments Clearwire Technologies, Inc.

[15] *See* Separate Statement of Commissioner Gloria Tristani, WT Docket No. 99-266 (Aug. 5, 1999).

to address this pressing problem.[16] The *Notice of Proposed Rulemaking* in that proceeding seeks comment on the potential of wireless technologies to provide telecommunications services to consumers located on tribal lands, and on ways in which the Commission can encourage the provision of these services to those areas.

The FreeSpace system, with its low infrastructure and equipment costs, has the potential to play a substantial role in bringing telecommunications to tribal lands and other underserved areas. This would be facilitated by not only the proposed six 1 MHz low power channels, but also the two higher powered channels (channels 1 & 2 on the chart above). This higher powered channels permit the use of larger cells, which are particularly useful in serving sparsely populated areas.

3. *The Commission Should Not Set-Aside Spectrum for Particular Services*

A number of parties have asked the Commission to set aside all or part of the 746-764 and 776-794 MHz bands for particular types of services. Private land mobile operators have requested that the Commission set aside a portion of these bands for private radio services only.[17] The Consumer Electronics Manufacturing Association (CEMA) has requested that *all* 36 MHz of spectrum in these bands be set aside for a new service it calls a "mobile multimedia broadcast service." The Commission should reject these proposals. They are inconsistent with the Act and contrary to the Commission's consistent efforts over the past several years to maximize the efficient use of the spectrum and promote innovative new services and technologies.

With respect to the private radio request, Congress has explicitly precluded an exclusive set aside for private radio operations the 746-764 and 776-794 MHz bands. Section 337(a) of the Act expressly directs that these bands be allocated "for commercial use to be assigned by competitive bidding pursuant to section 309(j)." [18] That provision further refers to the licenses assigned through this auction process as "commercial licenses."[19]

Section 337's use of the term "commercial" is significant. In the context of wireless services, both Congress and the Commission have long used the term "commercial" services or uses to distinguish such services from "private" or

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[16] *Extending Wireless Telecommunications Services to Tribal Lands, Notice of Proposed Rulemaking*, WT Docket No. 99-266, FCC 99-205 (released Aug. 18, 1999).

[17] *See* Comments of Motorola at 12-13; Comments of Industrial Telecommunications Association (ITA); Comments of United Telecom Council (UTC).

[18] 47 U.S.C. § 337(a)(2) ("Not later than January 1, 1998, the Commission shall allocate the electromagnetic spectrum between 746 megahertz and 806 megahertz, inclusive, as follows: ... 36 megahertz of that spectrum for commercial use to be assigned by competitive bidding pursuant to section 309(j).").

[19] *Id.* at § 337(b)(2) ("The Commission shall ... commence competitive bidding for the commercial licenses created pursuant to subsection (a) after January 1, 2001.").

"noncommercial" services, such as private land mobile. Section 332(d) of the Act, for example, defines "commercial mobile service" and "private mobile service" as mutually exclusive categories.[20] The Commission has incorporated this distinction in its rules.[21] Similarly, in implementing previous auction legislation, the Commission distinguished between "private" radio services, such as private land mobile, and services that "involve commercial use of the spectrum."[22] In drawing a distinction between these two categories, Congress and the Commission have generally defined commercial uses, such as cellular and personal communications services, as radio services offered to the public for hire.[23] Private radio services, such as private land mobile, in contrast, "are those that are used by government or business entities to meet their own internal communications needs or by individuals for personal communications, rather than to provide communications services to others."[24]

Arguments by private land mobile proponents for an exclusive set aside for private land mobile consequently fly in the face of the longstanding distinction between commercial and private uses and the explicit directive of section 337(a) that the Commission allocate the 746-764 MHz and 776-794 MHz bands for "commercial uses," *i.e.*, communications services offered to the public. To be sure, the Commission has sought comment on the possibility of a band manager bidding on spectrum in this band in order to sublicense the spectrum to users for internal communications purposes.[25] FreeSpace has no objection to the concept of a band manager bidding for spectrum in these bands along with other potential users. But, certainly the concept of a band manager should not be turned into a tool to limit the permissible services in any portion of the 746-764 MHz and 776-794 MHz bands to only private uses and excluding commercial wireless providers from bidding on the spectrum. This would flout the statutory directive that the 36 MHz at issue in this proceeding be allocated for "commercial uses." It would also represent a rather transparent attempt to limit artificially the number of potential auction bidders in order to benefit a particular group of communications users. Excluding commercial wireless services from bidding would turn the statutory requirement that this spectrum be assigned by auction into an empty gesture. For these reasons the Commission was eminently correct in its 1998 decision

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[20] *Id.* at § 332(d)(1) & (3).

[21] 47 C.F.R. §§ 20.7, 20.8.

[22] *Implementation of Section 309(j) and 337 of the Communications Act of 1934 as Amended*, 14 FCC Rcd 5206, ¶¶ 8-10 (1999) ("*Balanced Budget Act Notice*") (describing FCC's implementation of 1993 auction legislation). *See also Amendment of Part 90 of the Commission's Rules to Provide for the Use of the 220-22 MHz Band by the Private Land Mobile Radio Service*, 12 FCC Rcd 10943, ¶¶ (1997) (describing licensing plan that distinguished between "commercial" and "noncommercial" uses).

[23] *Private Land Mobile Radio Services: Background*, FCC Staff Paper, at E2-E5 (Dec. 18, 1996) (describing legal distinctions between commercial and noncommercial systems).

[24] *Balanced Budget Act Notice*, 14 FCC Rcd 5206, at ¶ 10.

[25] *Notice* at ¶ 15.

reallocating these spectrum bands when it rejected an argument to allocate spectrum in these bands exclusively to private radio services.[26]

In addition to being inconsistent with the statute, limiting any portion of these spectrum bands to particular types of services would reverse the clear course the Commission has charted over the past several years toward managing the spectrum efficiently and relying on marketplace forces to promote innovation. The Commission embraced these principles in the *Notice,* tentatively finding "that making spectrum available for flexible commercial use under our Part 27 Rules is in the pubic interest because it will contribute to technological and service innovation, the creation of new jobs for the American workforce, the fostering of national economic growth, and the enhancement of opportunities for all Americans to utilize, and realize the benefits of, the national telecommunications infrastructure."[27]

Private land mobile parties object to this finding, fearing that they will be outbid at an auction open to commercial services.[28] They further suggest that flexible service rules and the competitive bidding process are the product of "political forces ... asking the Commission to favor U.S. budgetary needs at the expense of sound spectrum management."[29] But, spectrum auctions not only serve the public interest by returning a portion of the value of the spectrum to the American public, they also serve the more fundamental purpose of assigning spectrum -- a scarce and valuable resource -- to the entity that values it the most and will therefore put it to the most economically efficient use. As the Commission has stated,

> Awarding licenses to those who value them most highly, while maintaining safeguards against anti-competitive concentration, will likely encourage growth and competition for wireless services and result in the rapid deployment of new technologies and services. Because firms have different views of the value of the licenses to be awarded, a firm that expects to be able to offer new or much lower cost services might be willing to pay more for a license than another firm that does not believe it can offer services as competitively.[30]

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[26] *Reallocation of Television Channels 60-69, the 746-806 Band,* 12 FCC Rcd 22953, ¶ 20 (1998) (*Allocation Report and Order*).

[27] *Id.* at ¶ 12.

[28] Motorola Comments at 13. *See also* ITA Comments at 5-6.

[29] ITA Comments at 4.

[30] *Implementation of Section 309(j) of the Communications Act -- Competitive Bidding,* 9 FCC Rcd 2348, ¶ 5 (1994). *See also Improving Commission Processes,* 11 FCC Rcd 14006, 14010 (1996); G. Rosston and J. Steinberg, *Using Market-Based Spectrum Policy to Promote the Public Interest,* OPP Working Paper No. (1997) (*reprinted in* vol. 50, no. 1, of the Federal Communications Law Journal); Evan Kwerel & Alex D. Felker, *Using Auctions to Select FCC Licenses,* OPP Working Paper No. 16 (1985); Thomas G. Krattenmaker & Lucas A. Powe, Jr., *Regulating Broadcast Programming* 53 (1994); Declaration of

Reserving a portion of the 746-764 and 776-794 MHz bands for exclusive private mobile radio use -- either directly or through the concept of a limited band manager -- runs contrary to these well-accepted principles and the Commission's efforts to promote efficient use of the spectrum.[31] Moreover, such an exclusive set aside removes the marketplace incentives licensees otherwise would have to innovate and use technologies that are the most spectrally efficient.

It should also be noted, as stated in Nextel Communications' comments, that "in today's commercial wireless marketplace, unlike the marketplace of the 1970s when the Commission crafted the private spectrum allocation, private spectrum users have numerous options for meeting their internal communications needs, including subscribing to any one of several commercial services or continuing to provide their own services."[32] SMR services provide one example of these options.[33] The FreeSpace system will provide another option, since it is well suited for point-to-multipoint voice and data dispatch communications.

The Commission should also reject CEMA's request that the 746-764 and 776-794 MHz bands be designated exclusively for its "mobile multimedia broadcast service." A number of commenters have opposed this request.[34] The Commission should not get into the business of picking "winners and losers" among commercial services and technologies that potentially could use these channels to serve consumers. Rather, the Commission should let the marketplace -- working through the competitive bidding process and ultimately consumer demand -- do this job.[35]

The Commission, of course, must establish a basic licensing framework that includes key elements, such as the performance and operational requirements described in the *Notice*. It must also play the vital role of establishing a channelization and technical plan to prevent interference among users in these bands as well to adjacent public safety operations. FreeSpace's proposal to create a low power guard band around public safety spectrum should be an important component of such a plan.

Aside from these basic "rules of the road," the Commission should let the auction process and the marketplace determine the specific services that will be provided to the

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Gregory L. Rosston, submitted with Comments of Nextel Communications filed Sept. 30, 1999 in WT Docket No. 99-87 (Rosston Declaration).

[31] *See* Rosston Declaration at 27 ("With overburdensome restrictions [on band managers] about what types of services can be provided or the eligibility of customers, the value of the spectrum will not be maximized.").

[32] Reply Comments of Nextel Communications at 4.

[33] *See* Comments of Southern Communications at 4.

[34] *See, e.g.*, Reply Comments of US West at 5.

[35] *See* Comments of US West at 5-6.

public over the commercial portions of the 700 MHz band. With this framework in place, it will be up to the ingenuity and commitment of CEMA's members, FreeSpace, and others to raise the capital necessary to bid for the spectrum and, ultimately, to persuade consumers to buy their services. Some will succeed and some will fail, as competition, not regulatory fiat, determines whose offering delivers the service and features that best serve the public.

4. *The Commission Should License the Eight 1 MHz Channels on a Nationwide Basis*

FreeSpace recommends that its proposed eight 1 MHz channels be licensed on a nationwide basis. The wireless communications services that will be offered on these channels would most efficiently be offered on a nationwide basis, allowing consumers to take advantage of a nationwide wireless network. It would also allow licensees to achieve scale economies in the equipment used in their systems, which will in turn lower prices for consumers.

Even if the Commission licensed this spectrum by smaller geographic areas, recent history in the wireless communications industry indicates that the market forces that favor nationwide networks likely would drive licensees to aggregate the smaller area licensees so that, in the end, through a series of private transactions, they achieved nationwide coverage. The end result would be the same as if the FCC adopted a nationwide licensing scheme, except that parties would have incurred substantial transaction costs and the rollout of nationally available services to consumers would have been unnecessarily delayed. To avoid these costs and encourage efficient spectrum usage, the Commission should license the spectrum from the outset on a nationwide basis.

The wisdom of a nationwide licensing approach is demonstrated by the clear trends in the mobile wireless industry that provide market evidence that nationwide aggregation is most desirable in terms of serving consumers. McCaw Communications, for instance, expended substantial resources during the 1980s to acquire significant aggregations of licenses. AT&T subsequently acquired McCaw and then used the PCS auctions to complement the McCaw holdings to form a near nationwide footprint. Sprint similarly used the PCS auctions to form its own nearly nationwide system. The trend favoring nationwide networks continues, as Vodafone-AirTouch and Bell Atlantic reportedly plan to merge their wireless holdings to form another near nationwide network. Nextel also has a nationwide footprint. Finally, VoiceStream has made significant acquisitions, including the purchase of Omnipoint and 360° Comm, in the past year that will enable VoiceStream to offer wireless services throughout most of the country.

Carriers are motivated by a number of factors in building nationwide networks. In addition to providing local service, they have the obvious advantage of giving subscribers the ability to roam. As noted above, nationwide networks also permit scale economies both in manufacturing and purchasing equipment, which results in lower costs

to consumers. A nationwide system also permits a carrier to market more effectively its service and generate consumer confidence in a quality brand.

Although the Commission declined to license PCS on a nationwide basis, its rationale for that decision does not apply today. In particular, the PCS rules were developed against the backdrop of an existing cellular system that licensed carriers on the basis of metropolitan statistical areas and rural service areas. The Commission reasonably decided to license PCS on a similar non-nationwide basis in order to promote competition by allowing existing cellular providers to bid for PCS licenses outside of their region and allowing new entrants to bid for such licenses within the existing cellular providers' regions. Today, in contrast, there are a number of mobile wireless communications services that operate on a nationwide basis. To promote competition in these services, the Commission should track this nationwide framework in licensing commercial services in the 700 MHz band.

Although licensing by smaller geographic areas might appear to promote entry by small business, minorities and women, the opposite may actually be true. The smaller licensing areas for PCS may have made PCS licenses more "affordable" for some small entrepreneurs. But these entities were nonetheless faced with the business need to acquire additional licenses to expand their services to broader regions. Similarly, carving up the 700 MHz commercial band into small geographic regions may simply deprive small businesses of the cost efficiencies and marketing advantages that come with nationwide coverage. From its perspective as a small, entrepreneurial start-up company, FreeSpace consequently supports the licensing of the eight 1 MHz channels on a nationwide basis. This would help small businesses offer innovative services and compete nationally.

Another benefit of a nationwide licensing scheme is that it will minimize the potential for interference disputes with existing full-power television broadcast stations operating on channels 60-69. These stations will be protected from interference during the transition to digital television. Although the FreeSpace proposal would pose little if any interference risk to these stations, any interference concerns that are raised by a broadcast licensee could much more readily be addressed by contacting a small group of nationwide licensees rather than dozens of geographically dispersed licensees of the eight 1 MHz channels.

Even with a nationwide licensing scheme, the Commission could still permit a licensee to elect to partition geographically its nationwide license. This would allow marketplace transactions to accommodate those instances where individual geographic areas would be better served by another licensee. Nextel and AT&T have undertaken just such transactions to induce entrepreneurs to help them to build out to more rural areas. Given the strong evidence in favor of a nationwide license, the cost of these transactions is likely to be significantly smaller than the transactions cost of building (or not being able to aggregate) a nationwide license.

In the event the Commission declines to license the 700 MHz band on a nationwide basis, the next-best solution would be to institute a straightforward combinatorial bidding system. Even if the FCC has not finalized such bidding systems, the auction for the 700 MHz commercial band could serve as a limited test of the combinatorial auction process by limiting combination bids to nationwide bids. If the nationwide bid were to exceed the total bids for individual geographic areas, then the FCC would award all of the licenses to the nationwide bidder. If not, the licenses would be assigned to the bidders for the smaller geographic areas.

* * * * *

In sum, FreeSpace Communications recommends that the Commission license eight 1 MHz, paired channels on a nationwide basis, with six of these channels subject to stringent power spectral density limits to protect adjacent channel public safety operations. Please direct any questions concerning this filing to the undersigned.

Respectfully submitted,

A. Richard Metzger, Jr.
Ruth M. Milkman
Charles W. Logan

Counsel to FreeSpace Communications

Attachments

cc:

James D. Schlichting
Kris Monteith
Tom Stanley
Ronald Netro
Jane Phillips
Gregory Vadas
Herb Zeiler
Robert Pepper
Evan Kwerel
Bruce Franca
Sean White
Kathleen Ham
Nancy Boocker
Walter Strack
Stanley Wiggins
Marty Leibman
D'wana Terry
John Borkowski
John Williams
Dale Hatfield
Julius Knapp

ATTACHMENT A

FreeSpace Communications

Freespace Communications is a company founded in April 1999 for the purpose of developing an innovative wireless communications technology that will deliver exciting new broadband voice and data service to consumers at low cost. Freespace was founded by Mike Farmwald, Tom Lee, Arvin Shahani, and Derek Shaeffer, and is a privately held company located in Silicon Valley.

Freespace Communications is funded by Benchmark Capital and Mike Farmwald. Benchmark (or its predecessor Merrill, Pickard, Anderson and Eyre) has participated with Dr. Farmwald in five other businesses, all of which have been successful.

Mike Farmwald has a long history of success in business, with an extraordinary record of successfully developing cutting edge technologies and turning them into successful businesses. He is one of the world's leading experts in computer science and electrical engineering. Dr. Farmwald is the founder and largest shareholder of Rambus, Inc., which was recently ranked by PC Magazine as one of the 100 most influential companies in the world of computing and the internet. Rambus, a publicly held company with a $1.6 billion market cap, designs and licenses high performance semiconductor memory devices that increase memory bandwidth. According to PC Magazine Online, Rambus memory "enhances multimedia and streaming applications and will star in the latest and greatest PCs."

In addition to Rambus, Dr. Farmwald has founded several other successful technology companies. These include three companies that were acquired by public companies -- FTL, Inc. by MIPS, Chromatic Research by ATI Technologies, and Epigram by Broadcom -- for a total of slightly less than $1 billion.

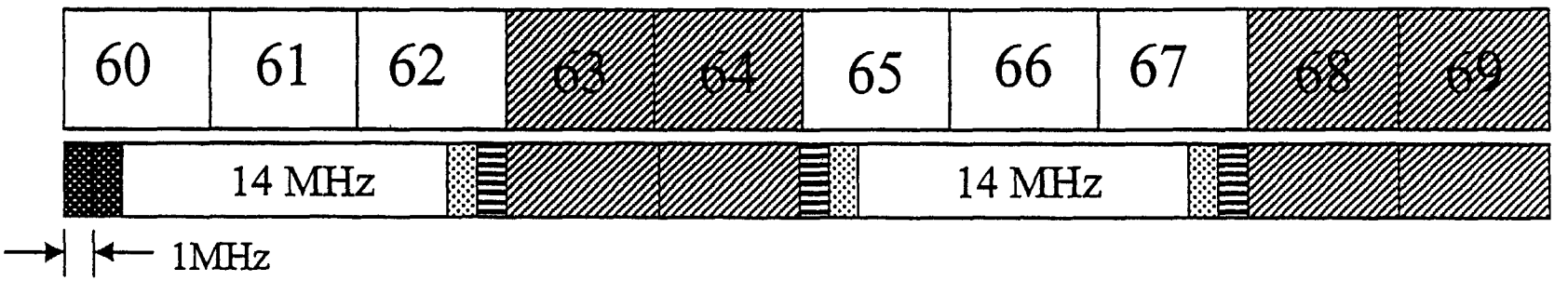
Tom Lee, Arvin Shahani and Derek Shaeffer are preeminent in the field of electrical engineering for their work in radio-frequency (RF) integrated circuit research at Stanford University. Dr. Lee is a professor of Electrical Engineering at Stanford, while both Dr. Shahani and Dr. Shaeffer received their doctorates from Stanford . They have done pioneering work in the young field of CMOS RF, a technology that promises to significantly reduce the cost of radio electronics. As a part of this work, they demonstrated the world's first complete, single-chip CMOS Global Positioning System (GPS) receiver. GPS is a system that provides accurate, mobile navigation services around the world. Single-chip GPS receivers allow GPS navigation capabilities to be embedded into consumer devices, such as cell phones. This capability can, for example, enable cell phones to automatically provide the location of an emergency call to a 911 dispatch center, greatly improving emergency response time.

Professor Lee is also a widely recognized speaker, twice the winner of the prestigious Best Paper award at the International Solid-State Circuits Conference (ISSCC), and the

author of a number of academic papers and the first ever textbook on CMOS RF. Dr. Shaeffer is also the author of several academic papers and a book on low-power CMOS radio receivers. Dr. Shahani is also a recognized speaker and winner of the Best Student Paper award at ISSCC.

Aside from the exciting technological innovations it has developed, FreeSpace is taking advantage of the exceptional financial backing and business acumen of Benchmark Capital. Benchmark is one of the premier venture capital funds in the world, with capital backing of over $1.4 billion and (to date) a total return in excess of $9 billion on investments of $450 million. Benchmark currently has investments in over 50 companies, including Ebay, Ariba, Rambus, and many others. Bruce Dunlevie, a partner in Benchmark, is working closely with FreeSpace, just as he has served as an advisor/board member on a number of previous companies founded by Dr. Farmwald. Mr. Dunlevie has extensive experience in the communications and computer industry, including serving on the boards of such publicly traded companies as Genesys, Guild.com, Handspring, Impresse, Rambus, and Wink.

FreeSpace Communications Channels 60-69 Proposal



License eight 1MHz, paired channels for innovative, low power uses that protect public safety band:

4mW/kHz 20mW/kHz > 20mW/kHz

Public Safety

License remaining 28MHz for higher powered mobile and fixed wireless services:

Two 14MHz bands for mobile & fixed wireless services